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## FINAL REPORT

NASA COOPERATIVE AGREEMENT NCC3-339

### "NEW, ENVIRONMENTALLY DURABLE MATERIALS AND COATINGS FOR SPACE APPLICATIONS"

December 15, 1995

#### PRINCIPAL INVESTIGATOR:

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## **I. GOALS AND OBJECTIVES**

To test and evaluate suitability of materials for use in space power systems and related space and commercial applications, and to achieve sufficient understanding of the mechanisms by which the materials perform in their intended applications. Materials and proposed applications included but were not limited to: Protective coatings for surfaces exposed to the space environment, thermal control materials and surfaces, arc-proof wire insulation for space power systems, iron-bearing graphite fibers for use in composite EMI shields, arc-proof transparent coatings for photovoltaic arrays, and cooperative research programs with industrial companies.

## **II. ACCOMPLISHMENTS vs GOALS AND OBJECTIVES**

Useful and informative results were obtained on virtually every material investigated under this Cooperative Agreement. The results were presented in a total of 13 technical papers and NASA Technical Memoranda (copies of covers attached).

We also worked on several materials in collaboration with other NASA centers when our expertise and the facilities at Lewis and Cleveland State University were best suited for certain aspects of the research.

Proposed research on a few materials was terminated early, by agreement between the Technical Monitor and Principal Investigator,

when research results or changing NASA needs suggested a shift to higher-priority items. That is consistent with the investigative nature of this research and the intent of the Cooperative Agreement instrument and does not indicate a failure to meet established goals.

In view of the above, one can conclude that the goals and objectives of this Cooperative Agreement have been met.

### III. INTERACTION WITH INDUSTRY

Several of our research projects attracted attention from commercial businesses. We discussed results with (or did collaborative work with) several companies including the following: Applied Sciences Incorporated (on high-conductivity graphite fibers), Sigma Technologies (iron-bearing graphite fibers), and AZ Technology (conductive white thermal control paints).

### IV. COSTS

All work was completed within budget. There were no cost overruns.